



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: <b>PCT/EP91/01632</b> (22) International Filing Date: <b>28 August 1991 (28.08.91)</b> (30) Priority data: <b>22249 A/90 30 November 1990 (30.11.90) IT</b> (71) Applicant (for all designated States except US): <b>KEIPER RECARO S.P.A. [IT/IT]; Via S. Antonio, 9, I-20122 Milano (IT).</b> (72) Inventor; and (75) Inventor/Applicant (for US only) : <b>BRIZZOLARA, Amerigo [IT/IT]; Norma S.r.l., Via Bigli, 19, I-20121 Milano (IT).</b> (74) Agents: <b>PERANI, Aurelio et al.; Jabobacci Casetta &amp; Perani, Via Visconti di Modrone, 7, I-20122 Milano (IT).</b></p>		<p>(81) Designated States: <b>AT, AT (European patent), AU, BB, BE (European patent), BF (OAPI patent), BG, BJ (OAPI patent), BR, CA, CF (OAPI patent), CG (OAPI patent), CH, CH (European patent), CI (OAPI patent), CM (OAPI patent), DE, DE (European patent), DK, DK (European patent), ES, ES (European patent), FI, FR (European patent), GA (OAPI patent), GB, GB (European patent), GN (OAPI patent), GR (European patent), HU, IT (European patent), JP, KP, KR, LK, LU, LU (European patent), MC, MG, ML (OAPI patent), MR (OAPI patent), MW, NL, NL (European patent), NO, RO, SD, SE, SE (European patent), SN (OAPI patent), SU*, TD (OAPI patent), TG (OAPI patent), US.</b>  <b>Published</b> <i>With international search report.</i></p>
<p>(54) Title: <b>A SPORT SEAT FOR MOTOR VEHICLES</b></p> <div> </div> <p>(57) Abstract</p> <p>This sport seat comprises a seating portion (3), a backrest portion (2), and at least one movable, lateral restraint side piece (5, 6) attached to the seat at the locations of the seating portion (3) and/or the backrest portion (2), on the side next to the motor vehicle door (P), and being guided for movement between a normal operating position of greater prominence from the seat and an entry/exit position of reduced prominence.</p>		

# + DESIGNATIONS OF "SU"

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## A SPORT SEAT FOR MOTOR VEHICLES

## DESCRIPTION

This invention relates to a sport seat for motor vehicles having seating and backrest portions.

Known are sport seats wherein the seating portion and the backrest portion of the seat include lateral restraint moldings which stand proud to a varying extent in order to hold the seat occupant more securely while negotiating a bend at a high speed.

Such moldings grow in size and importance with a greater accent on the sport character of the motor vehicle.

A drawback of such seats is that they tend to be awkward to enter and especially to leave, and the more so the taller are the moldings. This is a limitation that is usually coped with by the sportsman, but may pose serious problems to casual users, in particular ladies whose attire may be ill-suited to the movements involved in getting out of the motor vehicle.

Consequently, on motor vehicles which are not solely intended for sport uses, it is common practice to keep the molding profile fairly low at the expense of its restraint qualities on fast turns.

The underlying technical problem of this invention is to provide a seat which can ensure proper restraint of its occupant even on the fastest of turns while affording ease of entry/exit as demanded by non-sportsmen.

This problem is solved, according to the invention, by a sport seat being characterized in that it comprises at least one movable side piece for lateral restraint attached to the seat at the seating portion and/or backrest portion thereof, next to the motor vehicle door, and being guided for movement between a normal operating position of greater prominence on the seat and a less prominent entry/exit position.

Such a seat can solve the aforementioned problem by virtue of its varying shape; in its normal condition of use, its configuration is that of a sport seat, whereas in the

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entry/exit condition it presents no interfering protrusions on its door side, just as ordinary seats do.

The movable feature for the side piece can be obtained in a number of different ways. For instance, the side piece may be pivoted to the seat about an axis substantially parallel to either the seating or the backrest portion thereof. Alternatively, the side piece may be secured on the seat slidable in a plane substantially perpendicular to either the seating or backrest portion thereof. The choice of movement type will be tied to several different factors, typically to the space available inside the motor vehicle.

The seat may be provided with just one side piece, located either at the seating portion or the backrest portion, where some of the invention advantages can be forfeited. Preferably, this seat would instead include two side pieces, one located at the seating portion and another at the backrest portion. The amount of mobility which the two side pieces are allowed may be the same or different. In view of the amount of space normally available by the seat sides on the most popular of today's cars, the combination which is most likely to prove successful is one including a sliding side piece for the seating portion and a pivoting side piece for the backrest portion.

To operate each side piece, an irreversible electric motor and worm drive arrangement may be advantageously employed to actuate linkages and transfer gears of choice, known per se.

The side piece movements may be either controlled by hand (in the sense that it is the occupant who controls the side piece movements as appropriate) or automatically. In the latter case, a preferred control would have the side piece operation tied to an open-door sensor and the ignition key, so as to move the side piece to an entry/exit position with the engine switched off and the door open, or on the contrary, move the side piece to its normal position with the engine switched on and the door shut. The practical implementation of such a control will not be described in

detail herein because well within the ability of a skilled person in the art.

Further features and advantages of a seat according to the invention will become more clearly apparent from the following detailed description of a preferred embodiment thereof, to be read in conjunction with the accompanying drawings. In the drawings:

Figure 1 is a perspective view of a seat according to the invention as installed on a motor vehicle;

Figure 2 is a sectional detail view of the backrest of the seat shown in Figure 1;

Figures 3 and 4 are side views showing schematically the seating portion of the seat in Figure 1 in two different operating positions thereof; and

Figure 5 is a schematic, detail view of the seating portion of the seat in Figure 1 as viewed from above.

In the drawing figures, a sport seat for a motor vehicle A is generally indicated at 1.

The seat 1 comprises a backrest portion 2 and a seating portion 3, being of the adjustable type by means of electric actuators known per se which are controlled from a small keyboard 4 attached to the seat.

Two movable, lateral restraint side pieces 5 and 6 are attached to the seat 1, on the side next to the door P of the car A.

Side piece 5 is pivoted to the seat 1 about an axis 7 substantially parallel to the plane of the backrest portion 2.

Specifically, the backrest portion 2 comprises a rigid load-bearing structure 8 provided with a cushion 9 on its working face and a covering 10 on its back face. The structure 8 comprises, on its door P side, a box-type recess 11 and two pivot pins 12 adjacent to the recess 11 and the cushion 9. The pivot pins 12, only one of which is visible in Figure 2, are aligned along the axis 7.

Pivoted on the pins 12 is a load-bearing structure 13 of side piece 5. This structure 13, which is provided with a

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cushion 14 on its working face, has a substantially C-shaped cross-section arranged to cover the box-type recess 11. An electric motor 15, housed within the recess 11 and being attached to the load-bearing structure 8 of the backrest 2, rotates a worm 16 enmeshed with a spiral gear 17 supported rotatably on a bracket 18 made unitary with the load-bearing structure 13 of side piece 5.

Thus, the side piece 5 can be moved between a normal position of use (shown in Figure 2) and an entry/exit position (shown in dot-and-dash lines, again in Figure 2); the side piece 5 will therefore stand, in its normal position, significantly proud of the backrest 2 surface, and much less (or even not at all) so in the entry/exit position relatively to the backrest portion 2.

Side piece 6 is attached to the seat 1 slidable in a substantially perpendicular plane to that of the seating portion 3.

More specifically, the seating portion 3 comprises a rigid load-bearing structure 19 provided with a cushion 20 on its working face.

On its side next to the door P, this structure 19 includes a pivot pin 21 having an axis 22, substantially parallel to the seating portion 3. Pivoted on the pin 21 is a load-bearing structure 23 of side piece 6 provided with a cushion 24. An electric motor 25, secured on the load-bearing structure 19 of the seating portion 3, rotatively drives a worm 26 enmeshed with a spiral gear 27 supported rotatably on a boom 28 cantilevered from a shaft 29 which is supported rotatably on structure 19; rigidly attached to the shaft 29 is a throw 30 in pivotal engagement with a connecting rod 31 which is pivoted, in turn, to the load-bearing structure 23 of side piece 6. A peg 32 projecting from the structure 19 of the seating portion 3 engages slidably in a slideway 33 formed on the load-bearing structure 23 of side piece 6.

Thus, side piece 6 can be moved between a normal position (shown in Figure 3) and an entry/exit position

(shown in Figure 4); in its normal position, the side piece 6 stands significantly proud of the surface of the seating portion 3, and in the entry/exit position much less (or not at all) so relatively to the seating portion 3.

It should be noted that side piece 6 performs a substantially sliding movement relatively to the seating portion, in the plane of side piece 6. The fact that this sliding movement takes place, for convenience in guiding it, in the form of a rotation about axis 22 should not lead to confusing it with the (truly pivotal) movement of side piece 5 relatively to the backrest portion 2; in fact, and unlike the movement of side piece 5, the movement of side piece 6 would remain basically unchanged if, instead of pin 21, a more complex guiding arrangement were provided to ensure true parallel traversing of side piece 6 in its own plane.

This seat 1 further includes, on its remote side from the door P, restraint moldings 34 and 35 having the same shape as that taken by side pieces 5 and 6, respectively, when in their normal positions, thereby ensuring symmetry of the seat 1 configuration while in use.

The seat 1 also incorporates such ancillary equipment, neither explicitly described nor illustrated herein because conventional, as power supply and control wiring for the motors 15 and 25, limit switches for the side pieces 5 and 6 and respective leads, and other manually or electrically operated devices for adjusting in position the seating 3 and backrest 2 portions.

In addition, the seat 1 includes a control arrangement for the side pieces 5 and 6. This arrangement may be a simple, manually operated one through dedicated keys 36 and 37 on keyboard 4 to enable the occupant of seat 1 to change the setting of the side pieces 5 and 6 before stepping out of the motor vehicle and after entering it.

Alternatively, and preferably, the control arrangement may be automatically operated from a sensor effective to sense the open condition of door P, and from the key ignition switch (not shown). In this case, the side

pieces 5 and 6 would be brought automatically to their entry/exit positions, with the engine of motor vehicle A switched off and the door P open, and automatically restored to their normal operating positions with the door P shut and the engine of motor vehicle A switched on, optionally through a timer to prevent concurrent operation of motors 15 and 25 with the electric starter.



## CLAIMS

1. A sport seat for motor vehicles, comprising a seating portion (3) and a backrest portion (2), characterized in that it comprises at least one movable side piece (5,6) for lateral restraint attached to the seat at the seating portion (3) and/or backrest portion (2) thereof, next to the motor vehicle door (P), and being guided for movement between a normal operating position of greater prominence on the seat and a less prominent entry/exit position.

2. A seat according to Claim 1, characterized in that the side piece (5) is pivoted to the seat about an axis substantially parallel to the seating portion (3) or the backrest portion (2).

3. A seat according to Claim 1, characterized in that the side piece (6) is attached to the seat for sliding movement in a plane substantially perpendicular to the seating portion (3) or the backrest portion (2).

4. A seat according to Claim 1, characterized in that it comprises two side pieces (5,6), one located at the seating portion and another at the backrest portion.

5. A seat according to Claim 4, characterized in that the side piece (6) located at the seating portion (3) is attached to the seat for sliding movement in a plane substantially perpendicular to the seating portion.

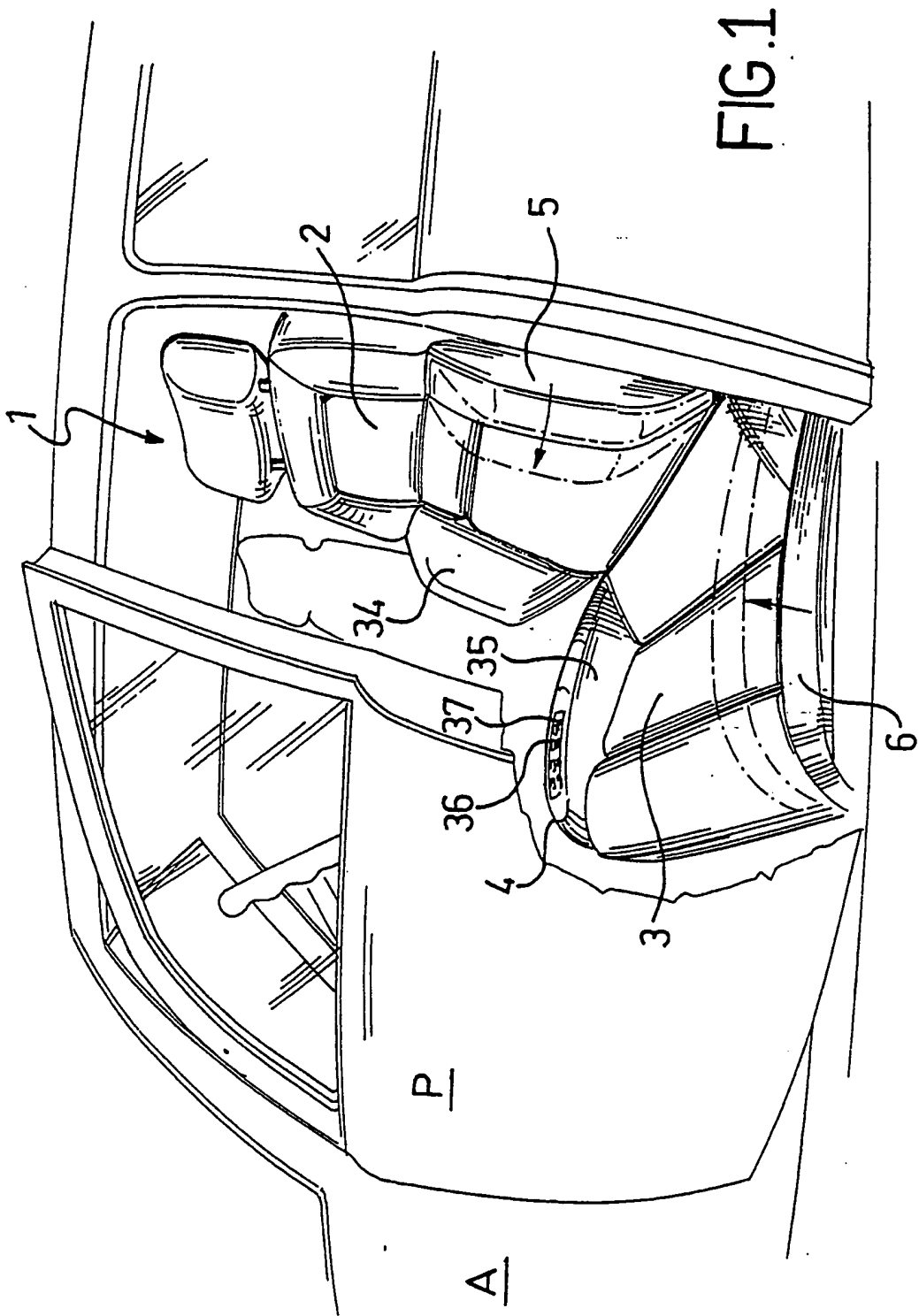
6. A seat according to Claim 4, characterized in that the side piece (5) located at the backrest portion (2) is pivoted to the seat about an axis substantially parallel to the backrest portion.

7. A seat according to any of the preceding claims, characterized in that it comprises, for each side piece, an irreversible actuating arrangement including an electric motor (15,25) and a worm drive (16,26).

8. A seat according to Claim 1, characterized in that it comprises a side piece control system linked operatively to an open-door sensor and the ignition key, to bring the side piece to its entry/exit position with the engine

switched off and the door open, and bring the side piece back to its normal position with the engine switched on and the door shut.

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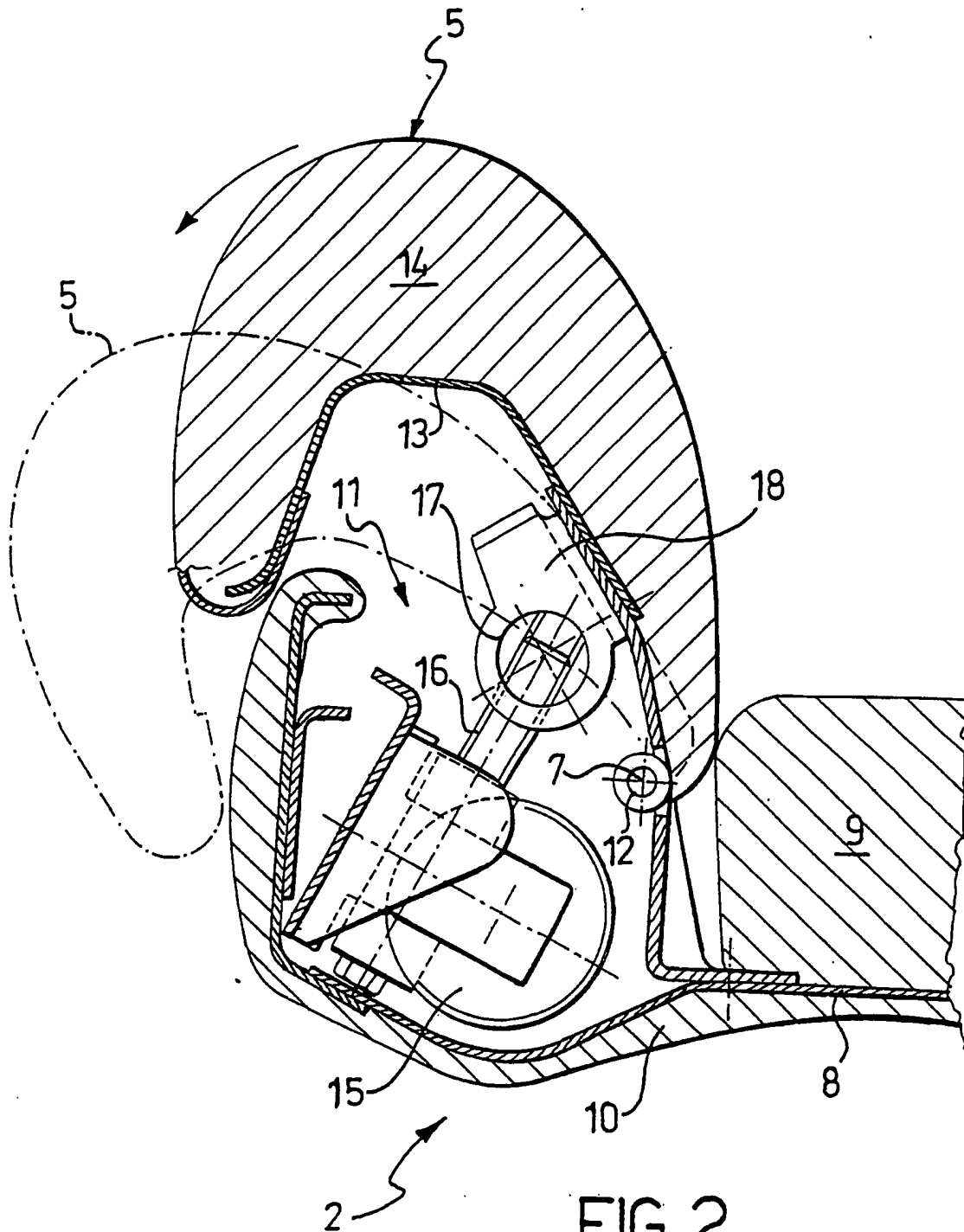


FIG. 2

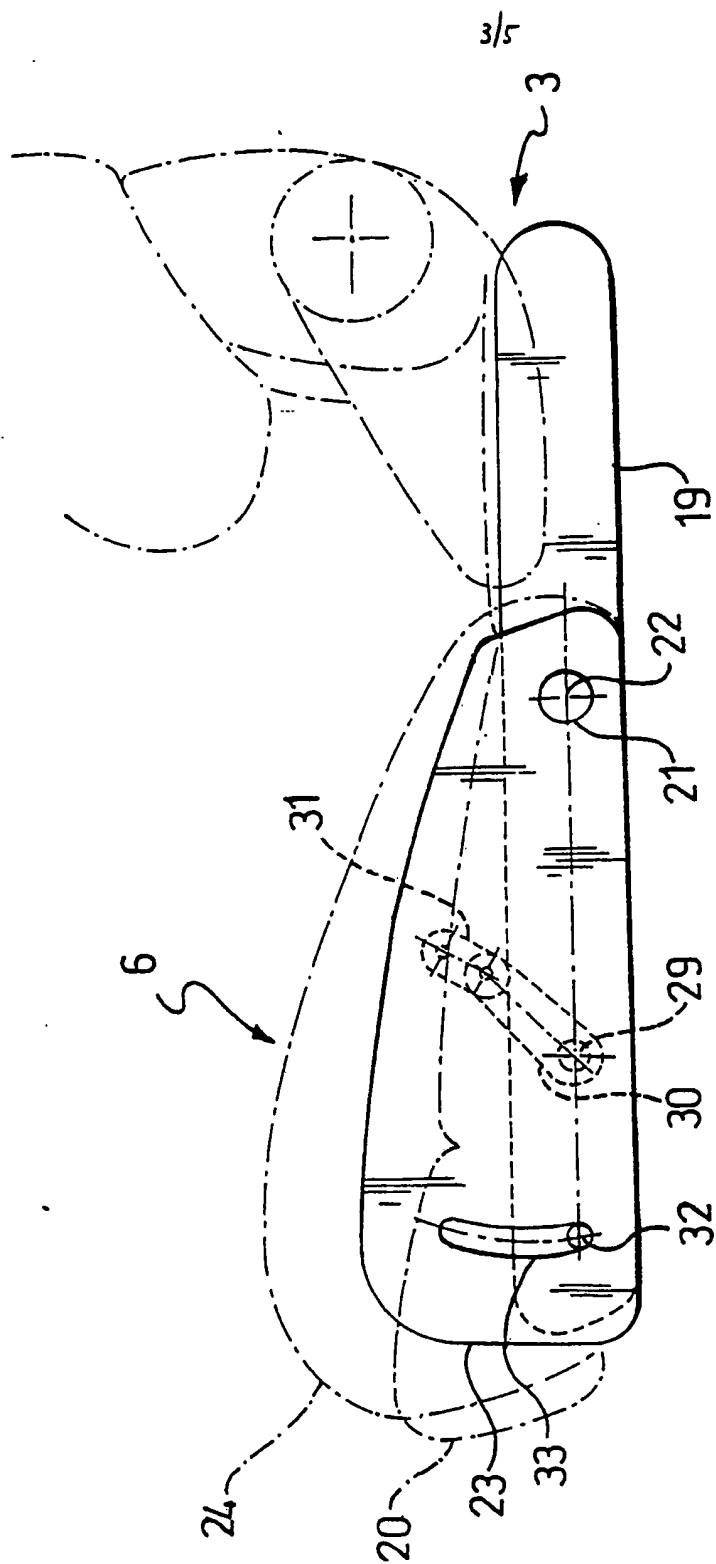


FIG. 3.

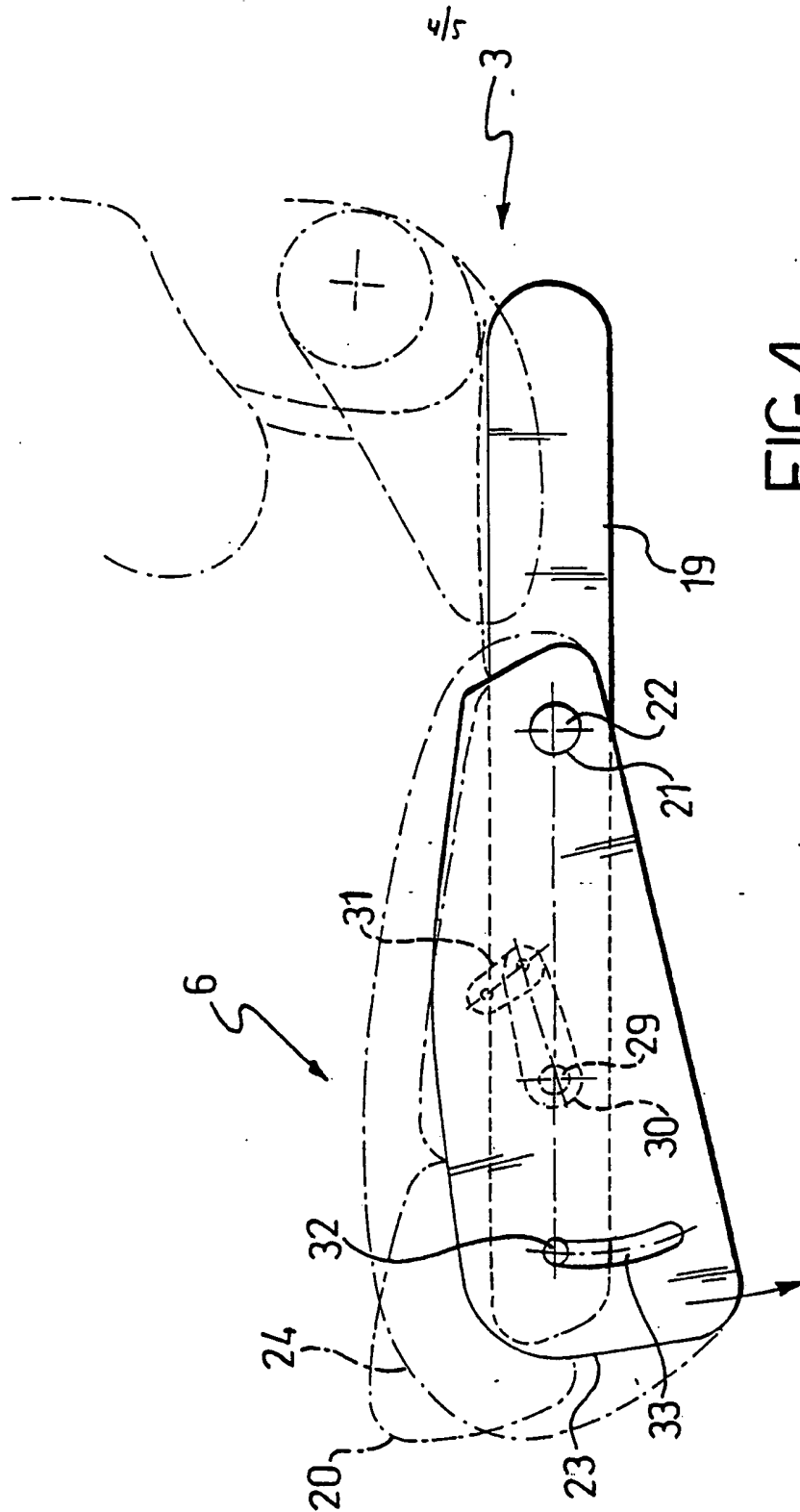


FIG. 4

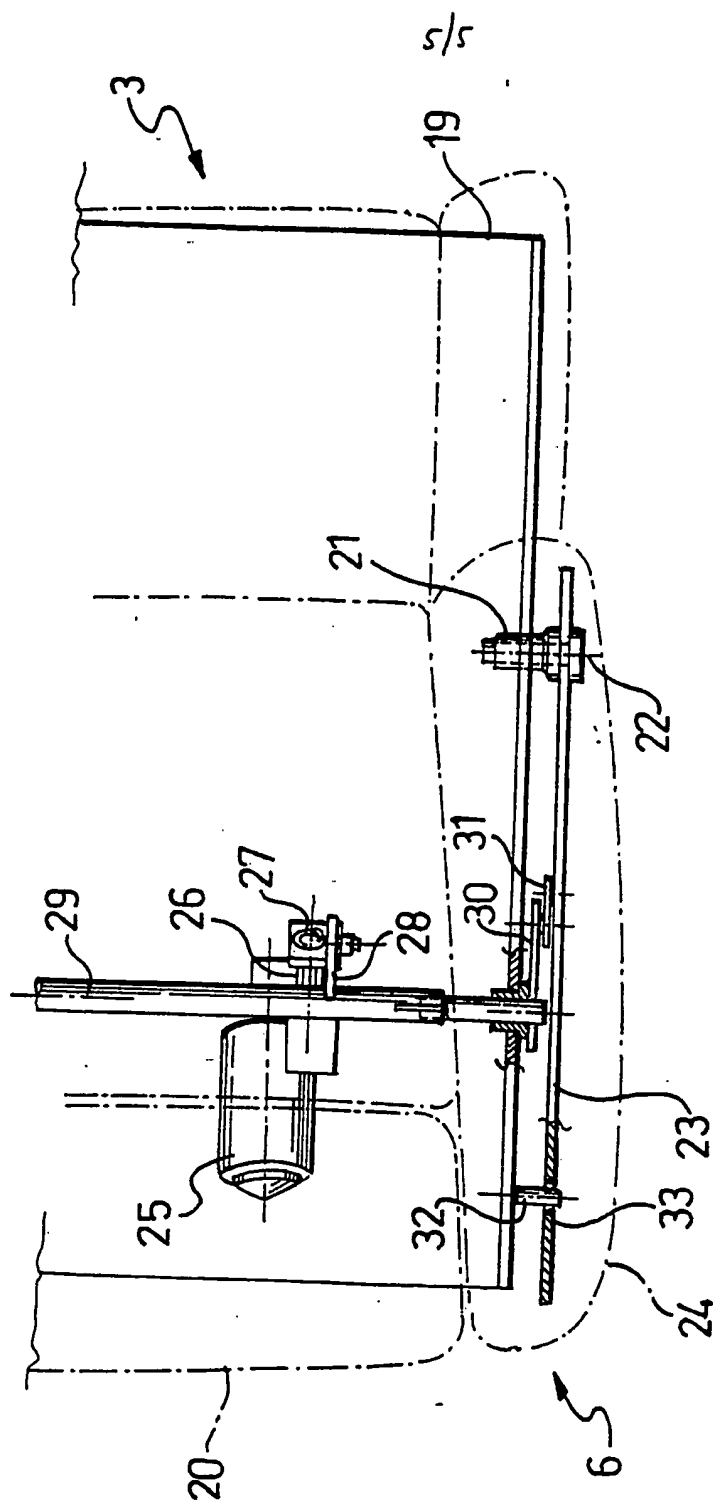


FIG.5

## INTERNATIONAL SEARCH REPORT

PCT/EP 91/01632

International Application No.

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (If several classification symbols apply, indicate all) <sup>6</sup>		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl. 5 B60N2/44		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched <sup>7</sup>		
Classification System	Classification Symbols	
Int.Cl. 5	B60N	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched <sup>8</sup>		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT<sup>9</sup></b>		
Category <sup>9</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
X	EP,A,0 328 137 (MARCHINO) 16 August 1989 see column 1; figures 1-3,11,12,14	1,2,4,6
Y	---	5
X	PATENT ABSTRACTS OF JAPAN vol. 10, no. 92 (M-14)9 Apr11 1986 & JP,A,60 229 831 ( NITSUSAN ) 15 November 1985	1,3
Y	see abstract	5
X	DE,A,3 643 876 (BAYERISCHE MOTOREN WERKE) 30 June 1988 see the whole document	1,2,7,8
X	PATENT ABSTRACTS OF JAPAN vol. 10, no. 59 (M-459)(2116) 8 March 1986 & JP,A,60 206 741 ( NITSUSAN ) 18 October 1985 see abstract	1,2,7,8
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<b>IV. CERTIFICATION</b>		
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III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category °	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
X	EP,A,0 318 355 (ECIA) 31 May 1989 see column 2, line 33 - column 5, line 59; figures 1-3 ---	1,2,7,8
X	US,A,4 924 162 (TAKAO) 8 May 1990 see column 2, line 59 - column 3, line 53; figures 1,2,4,6 ---	1,2,7,8
A	DE,A,3 031 581 (AISIN SEIKI) 12 March 1981 see claim 1; figures 1-3 ---	1,2,4

**ANNEX TO THE INTERNATIONAL SEARCH REPORT  
ON INTERNATIONAL PATENT APPLICATION NO.**

EP 9101632  
SA 50556

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A-0328137	16-08-89	US-A- 5022709	11-06-91
DE-A-3643876	30-06-88	None	
EP-A-0318355	31-05-89	FR-A- 2623758	02-06-89
		JP-A- 2003550	09-01-90
		US-A- 4938529	03-07-90
US-A-4924162	08-05-90	None	
DE-A-3031581	12-03-81	JP-C- 1453544	10-08-88
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